Lesson 2

Making a Living

Over two class periods, teachers use a combination of direct instruction and research to guide student learning about the functions of various organisms in different ecosystems. Students learn terms that scientists use for the functions of organisms in an ecosystem (for example, producer, consumer, herbivore, carnivore, omnivore, decomposer, and scavenger).

Students use their knowledge of the Sierra Nevada Mountains, the "Ecosystem Background Information" Activity Master, their textbooks, and other references to identify organisms and the functions they serve in California ecosystems. As a result, students learn that all ecosystems have organisms that fill similar roles. Class discussions enable students to see that humans depend on ecosystems and are consumers of food, energy, and materials that come from various ecosystems. Students demonstrate their learning by completing a study guide and creating drawings (in class and as homework) that identify common examples of the organisms that fill the functions or jobs in different ecosystems.

Background

There are certain functions or roles that organisms must fill to keep any ecosystem healthy and working properly. Different organisms perform similar functions in different ecosystems. There are always **producers**, **consumers**, **scavengers** and **decomposers**, though the types and numbers vary from ecosystem to ecosystem.

Virtually all ecosystems function in much the same manner. The solar energy captured in the chemical bonds inside producers (plants and certain bacteria) is transferred to consumers (animals) when the plants are eaten. Chemical reactions inside the bodies of animals release that energy, as needed, to carry on the basic life processes necessary for growth and survival. Certain animals consume plants directly to obtain this necessary energy; other animals consume other animals for it. Specific designations of species that are consumers are used when biologists talk about the primary source of energy in an animal's diet. If the animal primarily consumes plants, it is an **herbivore**. If meat is the primary source of energy in a consumer's diet, it is a **carnivore**. If the animal's diet is comprised of whatever consumable material it can find at a particular time, plant or animal, it is considered an **omnivore**. Humans are omnivorous by nature, although some of us have made dietary choices based on philosophical or health reasons.

Some plants, like the Venus flytrap are carnivorous but, none of these are native to California.

Scavengers and decomposers play critical roles in the transfer of energy and matter in ecosystems. Scavengers primarily eat dead and decaying plant and animal matter, consuming animals that have died from other causes and materials that other organisms may have discarded. The role in decomposition played by **bacteria**, **fungus (fungi)**, and various insects makes the nutrients in dead and decaying organic matter available to other parts of the ecosystem. Some organisms that are decomposers can pose a health threat to other organisms, including humans, if their populations become very large others may become parasites.

Learning Objectives

Give examples of the functions (producer, consumer, and decomposer) populations of organisms serve in an ecosystem.

Identify humans as consumers within ecosystems.

Key Vocabulary

Bacteria: One-celled organisms with no nucleus; many are important decomposers.

Carnivore: Organism whose primary food source is other animals.

Consumer: Organism that obtains energy and materials by eating other organisms.

Decomposer: Organism that gets its energy and materials by breaking down (decomposing) the remains of dead organisms and absorbing the nutrients.

Fungus (fungi): A group of organisms, including mushrooms and yeasts, that obtain their energy and nutrients from dead organic matter.

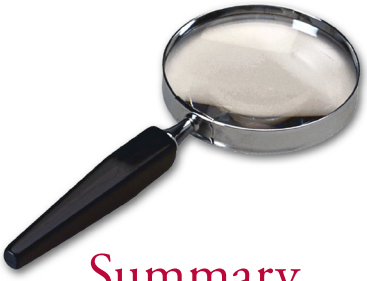
Herbivore: Organism whose primary food source is plants or other producers.

Omnivore: Organism that eats both plants and animals.

Producer: Organism such as a plant or alga that uses light energy or chemical energy to produce food (sugar) from inorganic chemicals.

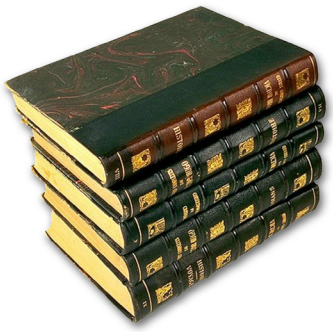
Scavenger: Organism that eats dead organisms.

Toolbox



Summary of Activities

Students learn the functions of various organisms in the Sierra Nevada ecosystem. They learn terms scientists use, conduct research on the functions of organisms, and demonstrate their learning by completing a study guide identifying examples and answering questions about organisms and their functions in a specific ecosystem.



Instructional Support

See Unit Resources, page 21

Prerequisite Knowledge

- Students should know that energy entering ecosystems as sunlight is transferred by producers into chemical energy through photo synthesis and then from organism to organism through food webs.
- Students should also know that matter is transferred over time from one organism to others in the food web and between organisms and the physical environment.
- Students should be able to use books or the Internet to obtain information about biomes or ecosystems.

Advanced Preparation

Make copies:
Make copies as indicated in the Activity Masters section below.

Create tranparencies:
Make transparencies of "Making a Living #1," "Making a Living #2," and "Organisms and Their Functions."

Materials Needed

Class Supplies:
Blank paper, colored pencils or crayons

Activity masters:
See below

Visual Aids

Transparencies:

- Wolverine in Its Habitat, page 99
- Making a Living #1, page 103
- Making a Living #2, page 104
- Organisms and Their Functions, page 105

Duration

Preparation time:
30 min.
Instructional time:
45 min.

Safety Notes

None

Activity Masters

Making a Living Study Guide
Page 75
One per student

California Ecosystem Information
Page 76
One per student

Procedures

Step 1

Project the **Wolverine in Its Habitat** (Lesson 2 Visual Aid) transparency and introduce the idea that different organisms in the habitat do different things. Emphasize that different organisms have different roles or functions. Ask students, "What is the main job of the plants?" *(Plants are producers that use water, carbon dioxide, and sunlight to produce sugars and starches (food) for other organisms.)* Ask students, "What are the functions or jobs of animals?" *(Consumers, decomposers, scavengers.)*

Step 2

List the following terms on the board: "producer, "consumer," "herbivore," "carnivore," "omnivore," "decomposer," "scavenger." Ask students for a brief definition of each and record those definitions. If students do not know what a word means, leave a blank for the definition.

Step 3

Draw the following chart on your board.

Role or Function	Field or Forest Plant or Animal	Pond Plant or Animal
Producer:		
Consumer (herbivores):		
Consumer (carnivores):		
Consumer (omnivores):		
Consumer (scavengers):		
Decomposer (bacteria and fungi):		

Step 4

Show the transparencies **Making a Living #1** (Lesson 2 Visual Aid) and **Making a Living #2** (Lesson 2 Visual Aid). Ask students to help complete the chart on the board by identifying the organisms that serve various functions in these natural communities (forests and ponds), noting that most decomposers such as bacteria and most fungi are too small to be seen in the illustrations. Complete or revise the class definitions in Step 2.

Step 5

Stress the fact that all natural communities have organisms that serve these functions; that is, all have producers, consumers, scavengers, and decomposers. Ask students for additional examples of organisms that serve these functions. List their examples under the terms written on the board. Point out that more than one term may apply to any particular organism. For example, a deer is both a consumer and an herbivore.

Step 6

Ask where people fit on the list. *(People are consumers and omnivores. Students may ask about vegetarians. While some people may choose not to eat meat, as a species, humans are omnivores.).*

Step 7

Use the **Organisms and Their Functions** (Lesson 2 Visual Aid) transparency to review the functions of organisms found in ecosystems.

Step 8

Distribute and discuss the **Making a Living Study Guide** (Lesson 2 Activity Master). Explain that students are research the functions of organisms in an ecosystem, record their information, and answer the questions on the study guide. They should also include drawings of organisms that serve different functions (producers, consumers, scavengers, and decomposers) in the selected ecosystem.

Step 9

Distribute the **California Ecosystem Information** (Lesson 2 Activity Master) chart. Assign or let students select one of the ten listed California ecosystems to research. Students should begin their research and start working on their study guides in class. They may consult their textbooks, the library, or the Internet if they need additional information. As homework, have students complete their study guides and produce their drawings and submit to teacher the following day.

Lesson Assessment

Instructions

Description:

The EEI Learning Objective for Lesson 2 states that students will give examples of the functions (producer, consumer, decomposer) populations of organisms serve in an ecosystem. Assessment of student learning will be determined as students complete the **Making a Living Study Guide** (Lesson 2 Activity Master). In the process students will identify common examples of the organisms that fill the functions or jobs in an ecosystem.

Instructions:

For teacher:

Distribute and discuss the **Making a Living Study Guide**. Explain that students will begin their research in class on the functions of organisms in an ecosystem, record their information, and answer the questions on the study guide. Study Guide may be completed as homework.

Suggested Scoring

Scoring Method:

Total Point Value: (30 points).

Use the point values listed on the **Making a Living Study Guide** to assess students' work. Students can also peer-and self-assess.

Making a Living Study Guide Sample Answers (Lesson 2 Activity Master)

My ecosystem type is: *Oak Woodland* (1 point)

Role or Function		Examples of Typical Organisms
Producers		*Trees: Oaks* *Flowers: Indian Paintbrush* (2 points)
Consumers	Herbivores	*Black-Tailed Deer* *Anna's Hummingbirds* (2 points)
	Carnivores	*Mountain Lions* *Lizards* (2 points)
	Scavengers	*Turkey Vultures* *Coyotes* (2 points)
	Omnivores	*Opossums* *Skunks* (2 points)
Decomposers		*Fungi* *Worms* (2 points)

Source(s) of information: *Name of sixth grade science book (Publisher), Internet (http://www.almaden.ibm.com/almaden/almaden/environs/habitats.html), encyclopedia (name), other books or source (provide name)* (2 points)

Questions:

1. What would happen to the consumers if there were no producers? (5 points)

   They would die. Some consumers are herbivores that eat plants; others may be carnivores that eat animals that may eat plants; or, other may be omnivores that eat both plants and animals. All consumers depend on plants as the original source of their energy.

2. What would happen if there were no decomposers? (5 points)

   Decomposers are organism that gets energy and materials by breaking down the dead plants and animals and their waste. Then they and absorb their nutrients.
   If decomposers did not exist, the plants would not get nutrients they need to survive, and dead matter and waste would pile up. If there were no plants, consumers would not have a source of food.

3. Why are people considered to be consumers? (5 points)

   People are consumers because they obtain energy and materials by eating other organisms like plants and/or animals.